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TITLE

FOREST INSECT SURVEY - LASSEN NATIONAL FOREST EAST SIDE TYPE

SEASON OF 1940

BY
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BERKELEY, CALIFORNIA
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SEASON OF 1940

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FOREST INSECT SURVEY - LASSEN NATIONAL FOREST
EAST SIDE TYPE

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INTRODUCTION

THE ANNUAL FOREST INSECT SURVEY OF THE EASTERN LASSEN AREA WAS CONDUCTED BY MEMBERS OF THE BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE DURING THE PERIOD OF OCTOBER 1 TO 22, 1940. THE FIELD SURVEY WAS UNDER THE DIRECTION OF N. D. WYGANT ASSISTED BY E. G. LIST, JR. AND F. R. THROOP. K. A. SALMAN MADE THE RECONNAISSANCE SURVEY OF THE INFESTATION UNITS, AND ALSO ASSISTED THE CREW AT THE START OF THE SURVEY. THE SURVEY PROCEDURE WAS THE SAME AS THAT USED ON THE AREA IN THE PAST, AND THE RESULTS OF WHICH HAVE BEEN PRESENTED IN ANNUAL REPORTS. ELEVEN PERMANENT SAMPLE PLOTS IN VIRGIN TIMBER AND 7 PLOTS IN CUTOVER TIMBER, 320 ACRES IN SIZE, OR A TOTAL OF 5,760 ACRES, WAS COVERED WITH A 100 PERCENT CRUISE TO DETERMINE THE INSECT CAUSED LOSS. THE LOSS FIGURES ON THESE PLOTS TOGETHER WITH RECONNAISSANCE OBSERVATIONS ARE THEN USED TO ESTIMATE THE LOSS ON THE INFESTATION UNITS. THE LOCATION OF THE SAMPLE PLOTS AND BOUNDARIES OF THE INFESTATION UNITS ARE SHOWN IN FIGURE 1.

CHARACTER OF THE 1940 INFESTATION

THE WINTER BROODS OF THE WESTERN PINE BEETLE, AS WELL AS COULD BE DETERMINED BY BASAL EXAMINATION OF THE TREES, WERE HEAVY AND SUCCESSFUL. SMALL GROUP KILLS, SELDOM CONTAINING MORE THAN FOUR OR FIVE TREES, WERE COMMON AND WIDELY SCATTERED. THE LOSS DURING 1940 ON THE SAMPLE PLOTS INCREASED APPROXIMATELY 40 PERCENT OVER THAT OF 1939. THIS REPRESENTS APPROXIMATELY THE SAME RATE THAT THE 1939 LOSS INCREASED OVER THE 1938 LOSS. HOWEVER, FOR THE EASTERN LASSEN AS A WHOLE THE 1940 LOSS IS ESTIMATED TO BE APPROXIMATELY 13 PERCENT GREATER THAN IN 1939. THE JEFFREY PINE LOSS ON THE SAMPLE PLOTS SHOWS APPROXIMATELY 140 PERCENT INCREASE. JUDGING FROM THE CHARACTER OF THE ATTACKS, THIS INSECT IS DEFINITELY ON THE INCREASE. ACTIVITY OF FLATHEADED BORERS APPEARED TO BE ABOUT THE SAME AS PREVIOUS YEARS. THE MOUNTAIN PINE BEETLE ACTIVITY IN PONDEROSA PINE HAS BEEN LIGHT AND CONFINED TO THE BASAL ATTACKS ON THE SMALLER TREES.

PINE LOSSES ON SURVEY PLOTS

THE AVERAGE ESTIMATED LOSS ON THE SAMPLE PLOTS FOR 1940, 124 B.M. PER ACRE, IS THE HIGHEST SINCE 1935 WHEN THE LOSS WAS 206 B.M. PER ACRE. THE CURRENT YEAR'S LOSS, HOWEVER, IS MUCH LESS THAN THE 359 B.M. RECORDED IN 1934. ANNUAL LOSS REACHED A LOW PERIOD DURING 1937 AND 1938 WHEN THE LOSS B.M. PER ACRE WAS 69 AND 60 RESPECTIVELY. DURING 1939 THE LOSS INCREASED TO 87 B.M. PER ACRE AND DURING 1940 TO 124 B.M. PER ACRE.

THE INSECT CAUSED LOSSES ON THE SAMPLE PLOTS FOR THE PAST THREE YEARS ARE SHOWN IN TABLE 1. THE GREATEST LOSS DURING 1940 OCCURRED ON THE HARVEY VALLEY PLOT, L-3 (SEE FIG. 1 FOR LOCATION OF PLOT), WITH 324 B.M. PER ACRE. TWENTY-THREE PERCENT, OR 73 B.M. OF THIS TOTAL WAS JEFFREY PINE KILLED BY THE JEFFREY PINE BEETLE.

THE JEFFREY PINE BEETLE WAS RESPONSIBLE FOR 18 PERCENT OF THE PINE LOSS ON THE PLOTS. THE LOSS VARIED FROM 97 B.M. PER ACRE ON PLOT L-12 TO NONE ON PLOTS WHERE THE HOST DID NOT OCCUR.

INSECT CAUSED LOSSES IN OTHER SPECIES

THE LOSSES IN SPECIES OTHER THAN PINE FOR THE PAST THREE YEARS ARE SHOWN IN TABLE 3. THE LOSS IS NEARLY ALL IN WHITE FIR, MOST OF WHICH PROBABLY WAS KILLED BY THE FIR ENGRAVER BEETLE. THE LOSS HAS BEEN FAIRLY COMMON IN THE WHITE FIR STANDS, BUT NOT AS HEAVY AS HAD BEEN EXPECTED ON THE BASIS OF OBSERVATIONS MADE IN THE FALL OF 1939.

PINE LOSS ON CUTOVER AREAS

THE INSECT CAUSED LOSSES IN CUTOVER AREAS ARE SAMPLED BY SEVEN PLOTS. THE LOCATION OF THESE PLOTS AND THE CUTOVER AREAS ARE SHOWN ON FIGURE 1. THE ANNUAL B.M. LOSS PER ACRE ON THESE PLOTS FROM 1938 TO 1940 ARE GIVEN IN TABLE 4. THE ESTIMATED LOSS FOR 1940 IS 13 B.M. PER ACRE AS COMPARED TO 14 B.M. IN 1939 AND 4 B.M. IN 1938. THE ESTIMATED ANNUAL GROWTH ON THE SAME PLOTS IS APPROXIMATELY 76 B.M. PER YEAR AND CONSIDERABLY ABOVE THE ANNUAL LOSS. THUS THE RECORD CONTINUED TO SHOW THAT LASSEN CUTOVER AREAS ARE CONTINUING TO ADD INCREMENT AND THAT INSECT CAUSED DRAIN IS REDUCING THE GROWTH OF THE STANDS BY ABOUT 17 PERCENT.

PINE LOSSES ON INFESTATION UNITS

THE 1940 PLOT DATA, SUPPLEMENTED BY RECONNAISSANCE NOTES, WERE USED IN ESTIMATING THE TOTAL CURRENT LOSS FOR THE INFESTATION UNITS (TABLE 2). SINCE ONLY PARTIAL SEASONAL LOSSES WERE OBTAINED FROM THE SURVEY IN OCTOBER, LATE SEASONAL FLUCTUATIONS OFTEN ALTER CURRENT ESTIMATES. THE LOSS FIGURES ON THE VARIOUS UNITS ARE TO BE CONSIDERED AS ESTIMATES ONLY. IN THE DISCUSSION OF THE UNITS THAT FOLLOWS, THEY HAVE BEEN GROUPED ACCORDING TO THE ESTIMATED VOLUME LOST PER ACRE.

A. <u>166 TO 227 B.M. LOSS PER ACRE</u>. INCLUDED IN THIS GROUP ARE HARVEY VALLEY WITH 227 B.M. PER ACRE, BLACK'S MOUNTAIN WITH 181 B.M., BOGARD BUTTES 170 B.M., AND CRATER MOUNTAIN WITH 166 B.M. THE LOSS ON THESE UNITS APPEARS TO BE THE HEAVIEST ON THE AREA COVERED BY THIS SURVEY. HOWEVER, SOME OF THE HEAVIEST STANDS ALSO OCCUR ON THESE AREAS SO THAT THE LOSS IS ESTIMATED TO AVERAGE BUT 1.2 PERCENT OF THE STAND. THE WINTER BROOD IN THESE AREAS APPEARS TO BE HEAVY AND THE INFESTATION MORE AGGRESSIVE, BUT STILL OF A HEAVY ENDEMIC TYPE. THE PERCENTAGE OF INCREASE IN LOSS DURING THE PAST TWO YEARS HAS BEEN GREATEST IN THIS GROUP. THERE IS A TENDENCY IN

SOME OF THE LOCALITIES TOWARD FAIRLY LARGE GROUPS, BUT FOR THE MOST PART THE GROUPS ARE SMALL AND SCATTERED.

B. 87 TO 125 B.M. LOSS PER ACRE. THE UNITS AND THE B.M. LOSS PER ACRE IN THIS INTERMEDIATE VOLUME LOSS GROUP ARE: STEPHANS RANCH, 125; BUTTE CREEK, 121; STRAYLOR LAKE, 104; AND GORDON VALLEY, 87. WHILE THERE HAS BEEN SOME INCREASE IN THE ANNUAL LOSS DURING 1940 THE INCREASE HAS NOT BEEN AS GREAT AS THAT IN GROUP A. IN SOME OF THESE UNITS A RELATIVELY HEAVY VOLUME LOSS IS THE RESULT OF SCATTERED INFESTATIONS IN A RELATIVELY SMALL NUMBER OF LARGE TREES. IN THE POORER SITES, HOWEVER, A PROPORTIONATELY GREATER NUMBER OF TREES ARE INVOLVED. ON THE AVERAGE THIS LOSS IS ESTIMATED TO BE BUT ABOUT 0.8 PERCENT OF THE STAND.

C. 61 TO 80 B.M. LOSS PER ACRE. THE UNITS AND THE B.M. LOSS PER ACRE INCLUDED IN THIS GROUP ARE: BEAVER CREEK, 80; HALL'S FLAT, 71; NIGGER SPRINGS, 70; CAVE MOUNTAIN, 70; COBLE MOUNTAIN, 65; AND BROCKMAN FLATS, 61. FOR THE MOST PART THESE UNITS REPRESENT FRINGE OR LIGHT STAND CONDITIONS. THE ESTIMATED LOSSES IN THESE UNITS FOR 1940 WERE LESS THAN THE LOSSES IN 1939 ALTHOUGH THEY REPRESENT ABOUT THE SAME PERCENT OF STAND, 0.85 PERCENT, AS IN GROUP B.

SUMMARY

THE COMBINED LOSS IN PONDEROSA AND JEFFREY PINE ON THE EASTERN LASSEN AREA IS ESTIMATED TO BE ABOUT 13 PERCENT HIGHER THAN IN 1939. THE LOSS PER ACRE ON ELEVEN 320-ACRE SAMPLE PLOTS AVERAGED 124 B.M.. THE AVERAGE OF THE EASTERN LASSEN AREA HAS BEEN ESTIMATED AT 119 B.M. PER ACRE. THE TOTAL INSECT CAUSED LOSS IN PINE ON THE EASTERN LASSEN AREA DURING 1940 IS ESTIMATED AT APPROXIMATELY 37 MILLION B.M. IT CAN STILL BE RATED AS A HEAVY ENDEMIC TYPE OF INFESTATION ALTHOUGH THE GROUPING TENDENCY CAN BE TAKEN TO INDICATE THAT EPIDEMIC TENDENCIES EXIST. IN GENERAL, THE LOSS AVERAGES A LITTLE LESS THAN ONE PERCENT OF THE STAND. ALTHOUGH THE HEAVIER VOLUME LOSSES TEND TO OCCUR IN THE BETTER STANDS IN THE UNITS BORDERING HARVEY AND GRAY'S VALLEYS, THE INFESTATION APPEARS TO BE WELL SCATTERED AND FAIRLY EVEN, IN TERMS OF PERCENT OF STAND, THROUGHOUT THE EASTERN LASSEN AREA.

RECOMMENDATIONS

THERE APPEAR TO BE NO CENTERS OF EPIDEMIC INFESTATION WHICH REQUIRE EMERGENCY ACTION AND THE USE OF DIRECT CONTROL OPERATIONS. HOWEVER, THE CONTINUING INCREASE IN INFESTATION AND LOSS, AND THE RELATIVELY LARGE SIZE OF THE ESTIMATED LOSS WHICH IS SUFFICIENT TO RUN A MODERATE SIZED MILL FOR A YEAR ON THE INSECT KILLED TIMBER ALONE, EMPHASIZE THE NECESSITY FOR SOME TREATMENT TO CONTROL OR PREVENT INFESTATIONS, OR TO UTILIZE THE MATERIALS THAT NOW ARE GOING TO WASTE. TO THAT END IT IS AGAIN POINTED OUT THAT EXPERIMENTS ON CONTROL THROUGH SANITATION-SALVAGE LOGGING BEING

CONDUCTED AT BLACK'S MOUNTAIN CONTINUE TO SHOW EXCELLENT RESULTS. THAT OR SOME SIMILAR METHOD IS WELL ADAPTED TO CONDITIONS IN THE EASTERN LASSEN AREA. THE ONLY THING LACKING IS TO PUT THE SANITATION-SALVAGE LOGGING CONTROL METHOD TO WORK AS A PRACTICAL MEANS OF AT LEAST SECURING SOME OF THE VALUES IN THE DYING TIMBER OR AS A MEANS OF SECURING CONTROL. THEREFORE IT IS AGAIN STRONGLY URGED THAT PRIVATE TIMBER LAND OWNERS AND PUBLIC AGENCIES COOPERATE IN AN ACTION PROGRAM. THE GENERAL HIGH HAZARD AND RELATIVELY HEAVY LOSS CONDITIONS IN MOST OF THE STANDS MAKE IT UNNECESSARY TO PICK OUT ANY PARTICULAR AREA IN WHICH CONTROL IS NEEDED MOST. HOWEVER, THE BUREAU AGAIN OFFERS ITS SERVICES AS A TECHNICAL AGENCY IN PICKING OUT AREAS AND ITS COOPERATION IN DEVELOPING AN ACTION PROGRAM FOR THIS AREA. THAT PROGRAM SHOULD HAVE AS ITS OBJECTIVE THE STOPPING OF AN UNNECESSARY WASTE OF TIMBER RESOURCES WHICH, SINCE 1933, HAS AVERAGED OVER 47 MILLION FEET PER YEAR.

TABLE 1. INSECT CAUSED LOSSES IN PINE ON PLOTS - LASSEN NATIONAL FOREST

PLOT NO.	1938 PER SECTION NO. TREES	1938 PER SECTION VOLUME B.M.	1938 PER A. VOLUME B.M.	1938 RATIO 38/37	1939 PER SECTION NO. TREES	1939 PER SECTION VOLUME B.M.	1939 PER A. VOLUME B.M.	1939 RATIO 39/38	1940 (ESTIMATED) PER SECTION NO. TREES	1940 (ESTIMATED) PER SECTION VOLUME B.M.	1940 (ESTIMATED) PER A. VOLUME B.M.	1940 (ESTIMATED) RATIO 40/39
L-1	72	69,328	108	1.8	44	33,320	52	0.5	49	56,603	88	1.7
L-3	56	54,474	85	0.5	78	76,380	119	1.4	153	207,286	324	2.7
L-5	26	32,748	51	0.9	64	79,660	124	2.4	100	132,425	207	1.7
L-6	24	15,686	25	0.6	58	36,220	57	2.3	44	44,954	70	1.2
L-7	18	32,566	51	0.9	42	41,740	65	1.3	42	41,341	65	1.0
L-8	22	41,960	66	1.0	58	79,960	125	1.9	43	69,194	108	0.9
L-10	38	43,042	68	1.2	76	60,340	94	1.4	81	39,117	61	0.6
L-11	30	44,490	70	0.6	40	71,580	112	1.6	64	105,587	165	1.5
L-12	20	32,390	51	1.2	28	40,100	63	1.2	31	77,538	121	1.9
L-13	20	23,402	37	0.6	32	32,040	50	1.4	43	37,902	59	1.2
L-14	34	28,316	44	0.7	48	60,240	94	2.1	52	64,434	101	1.1
AVER.	33	38,037	60	0.9	52	55,598	87	1.5	64	79,671	124	1.4

TABLE 2. INSECT CAUSED LOSSES ON INFESTATION UNITS
LASSEN NATIONAL FOREST

UNIT	VIRGIN TIMBERED ACREAGE*	1938		1939		1940	
		NO. TREES	VOLUME M.B.M.	NO. TREES	VOLUME M.B.M.	NO. TREES	VOLUME M.B.M.
BOGARD BUTTES	25,200	866	1,235	2,474	3,528	2,935	4,271
STEPHENS RANCH	27,760	694	861	2,349	2,915	2,602	3,446
BUTTE CREEK	27,260	1,022	1,663	1,374	2,235	1,320	3,303
HALL'S FLAT	11,320	1,273	611	1,887	906	693	801
NIGGER SPRING	14,830	742	489	2,250	1,483	1,020	1,042
BEAVER CREEK	27,550	1,378	1,350	2,531	2,480	2,045	2,203
BLACK'S MTN.	30,250	2,174	2,118	3,882	3,781	4,647	5,488
CRATER MTN.	14,100	441	578	1,560	2,045	1,763	2,334
HARVEY VALLEY	22,130	1,380	1,350	3,960	3,873	3,703	5,017
STRAYLOR LAKE	28,660	1,523	1,892	1,961	2,436	2,127	2,992
GORDON VALLEY	34,320	1,073	2,025	1,546	2,917	2,279	2,981
CAVE MTN.	17,460	982	1,327	1,163	1,571	1,864	1,229
LOGAN MTN.	2,060	90	117	190	247	239	229
COBLE MTN.	21,040	921	842	1,841	1,683	1,430	1,362
BROCKMAN FLAT	10,590	761	868	835	953	1,340	647
TOTALS	314,530	15,320	17,326	29,803	33,053	30,007	37,345

* VIRGIN TIMBERED ACREAGE AS OF JANUARY 1937.

TABLE 3. INSECT CAUSED LOSSES IN SPECIES OTHER THAN PINE, 1938-1940
PER SECTION BASIS

PLOT No.	TREE SPECIES	1938		1939		1940*	
		No. TREES	VOLUME B.M.	No. TREES	VOLUME B.M.	No. TREES	VOLUME B.M.
L-1	WHITE FIR			2	880		
L-5	WHITE FIR	26	52,900	20	52,900	50	92,960
L-8	WHITE FIR	8	11,300	14	17,760	14	4,660
L-10	(WHITE FIR	6	2,480	8	4,240	12	13,920
	(INCENSE CEDAR			2	1,220		
L-11	WHITE FIR	2	5,740				
L-13	INCENSE CEDAR			2	120		
L-14	WHITE FIR	12	8,680	12	5,420	12	4,440

* LOSSES FOR 1940 INCLUDE ONLY THOSE PICKED UP DURING THE FALL CRUISE. NO ALLOWANCE WAS MADE FOR THOSE WHICH HAD NOT YET STARTED TO FADE AND CONSEQUENTLY WERE MISSED.

TABLE 4. INSECT CAUSED LOSS IN PINE ON CUTOVER PLOTS
PER ACRE BASIS

PLOT No.	RESIDUAL STAND* ~~1932~~	AVERAGE ANNUAL GROWTH	VOLUME B. M. PER ACRE 1938 LOSS	1939 LOSS	1940 (ESTIMATED) LOSS
CO-6	2,736	45	4	10	22
CO-7	~~1,312~~ 4,100	128	3	18	14
CO-8	3,065	32	4	9	1
CO-9	~~3,875~~ 3,857	~~50~~ 69	3	6	5
CO-10	6,156	~~107~~ 108	11	26	7
CO-25			1	3	14
L-9				9	15
AVERAGE	~~3,429~~ 3,983	76	4	14	13

* Beginning of Season 1932